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LD 94: Multifrequency Signaling

Overlay program 94 allows the implementation and administration of R2 and L1 Multifrequency Compelled Signaling (MFC) and Multifrequency Signaling for Socotel (MFE) tables.

Prompts and responses

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Prompts and responses

Prompt	Response	Comment
REQ	aaa	Request (aaa = CHG, END, NEW, OUT, or PRT)
TYPE	aaaa	Type of data block (aaaa = L1MF, MFET, MFK5, MFK6, or R2MF)
ICOG	aaa	Incoming/Outgoing (aaa = ICT or OGT)
MAXT	(1)-127	Maximum Number of Tables
TBNO	1-127 <cr>	Table Number
CACD	(NO) YES	Category Code Default
- SET	(1)-10	Set category code
- ATT	(1)-10	Attendant category code
- TIE	1-(6)-10	TIE category code
- NTT	1-(6)-10	Non-TIE category code
EECD	1-127 <cr>	End-to-End Signaling Code
SMFC	(NO) YES	Send MFC
SCNT	(NO) YES	Switch CNI on Next
LVNO	1-6	Level Number
DFLT	0-127	Default Table number
RECV	1-15 mmmm	Receive signal number and mnemonic (MFC, MFE, MFK5 or MFK6)
	1-15 NUL	Remove signal number and mnemonic (MFC, MFE, MFK5 or MFK6)
XMIT	mmmm 1-15	Transmit signal mnemonic and number (MFC, MFE or MFK)
	mmmm 0	Remove signal mnemonic and number (MFC, MFE or MFK)
	IDCT n	Idle Call Trace Signal number

Table 18
MFC DID/TIE signal functions; Incoming and outgoing route tables

Group	Function mnemonic	Description of mnemonic
Forward Level 1 Group I	DGT1 -	Digit 1 -
	DGT9	Digit 9
	DGT0	Digit 0
	HTDM	H tandem signal. Sent before the called party DN if DN is in the Special Service List (SSL). The International Supplementary Features (SUPP) package 131 must be equipped.
	ECNI	CNI (Calling Number Identification) not available
	EODL	End of Dialing End of CPN (Calling Party Number) Request not accepted.
Backward Level 1 Group A	CCNI	Send category. Send first CNI digit. Send next CNI digit.
	COMP	Address Complete, next group
	CONG	Congestion
	FAIL	Call Failure
	NEXT	Send Next digit (fixed value)
	SCAT	Send Category
	SCNI	Send first CNI digit; send next CNI digit
	TERM	Terminated
	TFST *	Tandem, send first digit
	TNM1 *	Send last but one digit
	TNM2 *	Send last but two digits
	TNM3 *	Send last but three digits
	TNXT *	Tandem, send next digit
	VACO *	Vacant Office
(Part 1 of 2)		

Group	Function mnemonic	Description of mnemonic
Forward Level 2 Group II	OPER	Operator/attendant
	NOPR	Subscriber No Priority
	PRIO *	Subscriber with Priority
	REST	Restricted Station
	RICA *	Route Incoming Call to Attendant
	TOBI *	Toll Operator Break-In
	TOLL	Toll call
Backward Level 2 Group B	BUBA **	Busy (break in allowed after TOBI)
	BUBN **	Busy (break in not allowed after TOBI)
	BUSY	Station Busy
	CONG	Congestion
	FAIL	Failure
	IDCT	Idle Call Trace
	IDLE	Station Idle
	OUTT	Station Out-of-Order
	VACC	Vacant number
(Part 2 of 2)		

* Function will not be transmitted (Receive only)

** Function will not be received (Transmit only)

Note: Signal numbers not listed in Table 18 default to NUL (no assigned function).

Table 19
MFC DID/TIE default (standard) incoming table

Group	Signal number	Function mnemonic
Receive Level 1 Group I	1 -	DGT1 -
	9	DGT9
	10	DGT0
	12	ECNI
	15	EODL
Transmit Level 1 Group A	1	NEXT
	3	COMP
	4	CONG
	5	SCAT
	6	TERM
	9	SCNI
	15	FAIL
Receive Level 2 Group II	1	NOPR
	2	PRIO
	3	NOPR
	5	OPER
	6	NOPR
	7	REST
	8	NOPR
	9	PRIO
	10	OPER
	11	NOPR
	12	NOPR
	13	NOPR
Transmit Level 2 Group B	2	IDLE
	3	BUSY
	4	CONG
	5	VACC
	8	OUTT
	9	FAIL

Note: Signal numbers not listed in Table 19 default to NUL (no assigned function.)

Table 20
MFC DID/TIE default (standard) outgoing table

Group	Signal number	Function mnemonic
Transmit Level 1 Group I	1 -	DGT1 -
	9	DGT9
	10	DGT0
	12	ECNI
	15	EODL
Receive Level 1 Group A	1	NEXT
	2	TNM1
	3	COMP
	4	CONG
	5	SCAT
	6	TERM
	7	TMN2
	8	TNM3
	9	SCNI
	10	TFST
	11	TNXT
	15	FAIL
Transmit Level 2 Group II; Receive Level 2 Group B		
	1	NOPR
	5	OPER
	7	REST
	2	IDLE
	3	BUSY
	4	CONG
	5	VACC
	8	OUTT
	9	FAIL

Note 1: In Table 21, for incoming tables the signals which are received are forwarded signals, MFE tables have no Level 2 forward signals. Level 1 values for function xxxx range from DGT0 to DGT9 (Digits 0 - 9).

Note 2: Multiple function assignment allowed (same function to different signals).

Note 3: Signals transmitted in the case of incoming tables, are backward signals.

Table 21
MFE signal functions ; Incoming and outgoing route tables

Group I	Function mnemonic	Description of mnemonic
Forward Level 1	DGT1-9	Digits 1-9
	DGT0	Digit 0
	ACOC	Access code for a call to other installation
	ACSS	Access code for a call to special services
Backward Level 1	SACD	Send Access Code and Digits
	SEND	Send remaining digits (plus last digits if preceded by TRAN)
	COMP	Address Complete, change to Level 2 congestion
	TRAN	Transit connection
	FAIL	Failure, new attempt
	CONG	Congestion
Backward: Level 2	IDLE	Station Idle, charge call
	BUSY	Station Busy
	CONG	Congestion
	OUTT	Out-of-Order
	VACC	Vacant number

Table 22
MFE DID default incoming table

Group I	Signal number	Function mnemonic
Receive Level 1	1-9	DGT1-DGT9
	10	DGT0
Transmit Level 1	2	SEND
	3	COMP
	-	CONG
Transmit Level 2	1	IDLE
	3	BUSY
	3	CONG
	3	OUTT
	3	VACC

Table 23
MFE DOD default outgoing table

Group I	Signal number	Function mnemonic
Transmit Level 1	1-9	DGT1-DGT9
	10	DGT0
	1	ACOC
	5	ACSS
Receive Level 1	1	SACD
	2	SEND
	3	COMP
	6	TRAN
	8	FAIL
	9	CONG
Receive Level 2	1	IDLE
	2	IDLE

3	BUSY
4	IDLE
5	IDLE
6	IDLE
7	BUSY
8	BUSY
9	BUSY
10	BUSY

Table 24
2 of 5 MFK signal functions ; Incoming and outgoing route tables

Group	Function mnemonic	Description of mnemonic
Forward Group I	DGT0-9	Digits 0-9
Forward Group II	LOCB	Regular subscriber
	SERB	Special Services inside the province
	NATB	National
	INTB	International
Backward Code A	GRPA	Send Group a digits
	CCAL	Send Class of Call
	GRBC	Send Group bc digits
	SALL	Send All the digits
	GRPC	Send Group c digits
	COMP	Change to code "b"
	CONG	Congestion
Backward Code B	FMTR	Subscriber free with Metering
	CONG	Congestion
	BUSY	Subscriber Busy
	OUTT	Line dead

EOSL	End of Selection without line state reached

Table 25
2 of 6 MFK signal functions ; Incoming and outgoing route tables

Group	Function mnemonic	Description of mnemonic
Forward Group I	DGT0-15	Digits 0-15
Forward Group II	LOCB	Provincial-regular subscriber (charging by block)
	LOCL	Provincial-regular subscriber (charging by line)
	NATB	National-regular subscriber (charging by block)
	NATL	National-regular subscriber (charging by line)
	INTB	International-regular subscriber (charging by block)
	INTL	International-regular subscriber (charging by line)
	SERB	Special services (charging by block)
	SERL	Special services (charging by line)
Backward Code A	GRBC	Send Group BC digits
	SALL	Send All the digits
	SORG	Send Origination subscribers number - All Digits
	CCAL	Send Class of Call
	CONG	Congestion
	COMP	Change to code "B"
Backward Code B	FMTR	Subscriber free with Metering
	CONG	Congestion
	BUSY	Subscriber Busy
	OUTT	Line dead
	EOSL	End of Selection without line state reached

Table 26
Programmable signals for all 6 L1 signaling levels

Group	Function mnemonic	Description of mnemonic
Forward Level 1	DGT1 -	Digit 1 -
	DGT9	Digit 9
	DGT0	Digit 0
	UREJ	Level 1 signal rejected (Abort call)
	GOEN	Change to a Supplementary Service (SS) level. New level is Level 6 when terminator has a Backward Supplementary Service (BSS). Otherwise, the new level is Level 5.
	EODL	End of Dialing. No more digits to send. Aborts call when no digits have been received.
Backward Level 1	NEXT	Send Next digit in destination address
	TNFS	Tandem encountered. Send digits again starting from the first digit.
	COMP	Address Complete (Terminate signaling)
	FAIL	Call Failure (Abort call)
	SCAT	Send calling party category (always rejected)
	TERM	Address complete (Terminate signaling)
	CONG	Congestion (Abort call)
	EINF	Request change from Level 1 to Level 6 for BSS activity. Enhanced signal set is implied.
	ELV2	Address complete. Change to Level 2. Signaling will also use Level 3 or higher.
	ENO1	Request next digit in destination address. Implies using at least Level 3 signaling.
Forward Level 2	TNTX	Tandem encountered (Send next digit)
	OLNE	Originator is a subscriber without priority
	OPER	Originator is an attendant
(Part 1 of 3)		

Group	Function mnemonic	Description of mnemonic
Backward Level 2	NETW	Network call for Ring Again (RGA). Call is not intended for termination at a station.
	LSIG*	Restricted circuit
	BUSY	Destination is busy
	FAIL	Call has failed. Abort.
	VCOT	Call has terminated on a vacant DN
	IDLE	Destination is idle
Forward Level 3	CONG	Congestion (Abort call)
	SOTI	State of Termination undetermined
	SIIN	Simple call (No restrictions)
Backward Level 3	SUPL	Request a Forward Supplementary Service (FSS)
	NOSS	No further SS activity
	TERM	Call complete (Terminate signaling)
	FAIL	Call has failed (Abort)
	SUPL	Request BSS activity
Forward Level 4	SCNI**	Request Call Number Indicator (CNI)
	NEXT	Send FSS digit
	DGT1 -	CNI digit 1 -
	DGT9	CNI digit 9
	DGT0	CNI digit 0
Backward Level 4	LFSS	Change to Level 1 when CNI is complete.
	EODG	No more CNI digits.
	DGT1 -	CNI digit 1 -
	DGT9	CNI digit 9
	DGT0	CNI digit 0
	KEND	Changing to Level 6. Preceded by a LFSS signal.
(Part 2 of 3)		

Group	Function mnemonic	Description of mnemonic
	NEXT	Send next CNI digit
Forward Level 5 and Backward Level 6		
	DGT1	FSS digit 1
	DGT2	FSS digit 2
	DGT3*	FSS digit 3
	DGT4**	FSS Digit 4
	DGT5**	FSS Digit 5
	DGT6*	FSS Digit 6
	DGT7*	FSS Digit 7
	DGT8*	FSS Digit 8
	DGT9*	FSS Digit 9
	DGT10*	FSS Digit 10
	DGT11**	FSS Digit 11
	DGT12**	FSS Digit 12
	DGT13*	FSS Digit 13
	DGT14*	FSS Digit 14
	DGT15*	FSS Digit 15
Backward Level 5 and Forward Level 6		
	KEND	SS successful (Terminate signaling)
	FEND	SS failed (Terminate signaling)
	KMFC	SS successful (Signaling continues at a slower rate)
	FMFC	SS failed (Signaling continues at a slower rate)
	NEXT	Request next SS digit
(Part 3 of 3)		

* Function will not be transmitted (Receive only)

** Used for Ring Again (RGA)

Table 27
MFC default (standard) incoming tables for L1 signaling

This table indicates the default signal tables for L1 signaling. The transmit sets indicate only those signals that can be sent. The receive sets must have duplicate signals in order to be able to accept signals that must be mapped to another signal for processing.

Group	Signal number	Function mnemonic
Receive Level 1 Group I	1 -	DGT1 -
	9	DGT9
	10	DGT0
	12	UREJ
	13	GOEN
	15	EODL
Transmit Level 1 Group A	1	NEXT
	2	TNFS
	3	COMP
	4	FAIL
	5	SCAT
	6	TERM
	9	CONG
	10	EINF
	11	ELV2
	12	ENOI
	14	TNXT
Receive Level 2 Group II	1	OLNE
	2	LSIG
	4	OLNE
	5	OPER
(Part 1 of 4)		

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Group	Signal number	Function mnemonic
	7	OPER
	8	OPER
	9	OPER
	10	NETW*
	11	OLNE
	12	UREJ
	13	OLNE
Transmit Level 2 Group B	3	BUSY
	4	FAIL
	5	VCOT
	6	IDLE
	9	CONG
	14	SOTI
Receive Level 3 Group III	1	SIIN
	2	SIIN
	3	SIIN
	4	SIIN
	5	SUPL
	6	SUPL
	7	SUPL
	8	SUPL
	9	SIIN
	10	SIIN
	11	SUPL
	12	SUPL
	15	NOSS
Transmit Level 3 Group C	1	TERM
(Part 2 of 4)		

Group	Signal number	Function mnemonic
	4	FAIL
	8	SUPL
	9	SCNI*
	15	NEXT
Receive Level 4 Group IV	1 -	DGT1 -
	9	DGT9
	10	DGT0
	11	LFSS
	15	EODG
Transmit Level 4 Group D	1 -	DGT1 -
	9	DGT9
	10	DGT0
	11	KEND
	15	NEXT
Receive Level 5 Group V	1 -	DGT1 -
	9	DGT9
	10 -	DG10 -
	15	DG15
Transmit Level 5 Group E	11	KEND
	12	FEND
	13	KMFC
	14	FMFC
	15	NEXT
Receive Level 6 Group VI	11	KEND
	12	FEND
	13	KMFC
(Part 3 of 4)		

Group	Signal number	Function mnemonic
Transmit Level 6 Group F	14	FMFC
	15	NEXT
	1	DGT1
	2	DGT2
	4	DGT4
	13	DG13
(Part 4 of 4)		

* Not included unless Ring Again (RGA) is included for L1 signaling.

Table 28
MFC default (standard) outgoing tables for L1 signaling

This table indicates the default signal tables for L1 signaling. The transmit sets indicate only those signals that can be sent. The receive sets must have duplicate signals in order to be able to accept signals that must be mapped to another signal for processing.

Group	Signal number	Function mnemonic
Transmit Level 1 Group I	1 -	DGT1 -
	9	DGT9
	10	DGT0
	12	UREJ
	13	GOEN
	15	EODL
Receive Level 1 Group A	1	NEXT
	2	TNFS
	3	COMP
(Part 1 of 4)		

Group	Signal number	Function mnemonic
	4	FAIL
	5	SCAT
	6	TERM
	7	RUID
	8	ALFS
	9	CONG
	10	EINF
	11	ELV2
	12	ENOI
	13	PSNX
	14	TNXT
Transmit Level 2 Group II	1	OLNE
	2	LSIG
	5	OPER
	10	NETW*
Receive Level 2 Group B	3	BUSY
	4	FAIL
	5	VCOT
	6	IDLE
	9	CONG
	10	BUSY
	11	IDLE
	12	BUSY
	13	IDLE
	14	SOTI
Transmit Level 3 Group III; Receive Level 3 Group C		
(Part 2 of 4)		

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Group	Signal number	Function mnemonic
	1	SIIN
	5	SUPL
	15	NOSS
	1	TERM
	2	TERM
	3	TERM
	4	FAIL
	5	TERM
	7	SUPL
	8	SUPL
	9	SCNI*
	10	SUPL
	11	SCNI*
	12	SCNI*
	13	SUPL
	14	SCNI*
	15	NEXT
Transmit Level 4 Group IV	1 -	DGT 1 -
	9	DGT9
	10	DGT0
	11	LFSS
	15	EODG
Receive Level 4 Group D	1 -	DGT 1 -
	9	DGT9
	10	DGT0
	11	KEND
	15	NEXT
(Part 3 of 4)		

Group	Signal number	Function mnemonic
Transmit Level 5 Group V	1 -	DGT1 -
	3	DGT3
	4	DGT4*
	5	DGT5*
	6 -	DGT6 -
	9	DGT9
	10	DGT0
	11	DG11*
	12	DG12*
Receive Level 5 Group E	11	KEND
	12	FEND
	13	KMFC
	14	FMFC
	15	NEXT
Transmit Level 6 Group VI	11	KEND
	12	FEND
	13	KMFC
	14	FMFC
	15	NEXT
Receive Level 6 Group F	1 -	DGT 1 -
	9	DGT9
	10	DGT0
	11 -	DG11 -
	15	DG15
(Part 4 of 4)		

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* Not included unless Ring Again (RGA) is included for L1 signaling.

Alphabetical list of prompts

Prompt	Response	Comment	Pack/Rel
ATT	(1)-10	Attendant category code Category code for attendants	mfc-10
CACD	(NO) YES	Category Code Default Change category code default. Prompted when TYPE = R2MF	opcb-14
DFLT	0-127	Default table number	mfc-10
EECD	1-127 <cr>	End-to-End Signaling code Default to TBNO response when REQ = NEW otherwise leave TBNO as assigned.	mfc-18
ICOG	ICT OGT	Incoming/Outgoing Incoming table Outgoing table	mfc-10
LVNO	1-6	Level Number • 1-2 for TYPE = R2MF, MFK5, MFK6 • 1-6 for TYPE = L1MF Precede with X to remove.	mfc-10
MAXT	(1)-127	Maximum number of Tables Prompted when REQ = NEW	mfc-10
NTT	1-(6)-10	Non-TIE category code Category code for non-TIE trunks	mfc-14
RECV	1-15 mmmm	Receive signal number and mnemonic (MFC, MFE, MFK5 or MFK6) Signal number range is: • 1 - 10 if TYPE = MFK5 • 1 - 15 if TYPE = MFK6	mfc-10
	1-15 NUL	Remove signal number and associated function mnemonic.	
	<cr>	Stop RECV prompts Refer to Tables 18 through 28 for function mnemonics.	

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Prompt	Response	Comment	Pack/Rel
REQ	CHG END NEW OUT PRT	Request Change existing data. Exit Overlay program. Add new data to the system. Remove data block. Print data.	mfc-10
SCNT	(NO) YES	Switch CNI on Next. When the NEXT signal is received during CNI transmission on Level 1, the system will continue with sending the calling number. When the NEXT signal is received during CNI transmission on Level 1, the system will switch to called number and then send the next called number digit.	mfc-18
SET	(1)-10	Set category code. Category code for SL-1 and 500/2500 sets.	mfc-10
SMFC	(NO) YES	Send MFC Backward signals are stopped when the forward signal is recognized as having stopped. Backward signals are sent (incoming calls) pulsed for 150 ms or received (outgoing calls) pulsed 150 ms +/- 20%.	mfc-18
TBNO	1-127 <cr>	Table Number MFC, MFE, MFK5 or MFK6 table number Print all MFC, MFE, MFK5 or MFK6 tables.	mfc-10
TIE	1-(6)-10	TIE category code Category code for TIE trunks	mfc-10
TYPE	L1MF MFET MFK5 MFK6 R2MF	Type of data block. L1 MFC data block Must have X08 to X11 Gateway (L1MF) package 188. MFE data block 2/5 Spanish KD3 MF Signaling 2/6 Spanish KD3 MF Signaling R2 MFC data block	mfc-10

Prompt	Response	Comment	Pack/Rel
XMIT	mmmm 1-15	Transmit signal mnemonic and number (MFC, MFE or MFK) • 1 - 10 if TYPE = MFK5 • 1 - 15 if TYPE = MFK6	mfe-10
	mmmm 0	Remove function mnemonic mmmm and associated signal number Any undesired function in the default transmit tables should not be removed, but instead assigned a different signal number. LNVO is prompted following a null entry for XMIT. If nothing is entered in response to LVNO then, provided that there is a level one, the table is stored.	
	IDCT n	Idle Call Trace signal number (Default is the same as the IDLE signal) Where: n = signal number and 0 = close	
	<cr>	Stop XMIT prompts. Refer to Tables 17 through 26 for the function mnemonics.	